Incorporating Sarbanes-Oxley Into A College Accounting Curriculum: Lessons Learned

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ABSTRACT

This paper attempts to identify the ways and give examples of how Sarbanes-Oxley compliance can be taught in real time using the SAP R/3 system and the many lessons derived from the experience. The Sarbanes-Oxley Act significantly impacts CEO's, CFO's and public accountants. It also applies to all levels of management. Organizations and their managers need to recognize the significance of Sarbanes-Oxley compliance as well as the benefits it can provide. These benefits include reliability of the financial statements, quality of reporting, and also the opportunity to review a company's processes and enhance the efficiency of all financial and operating departments. Integrating SAP technology into the classroom has been one of the primary initiatives of the Department of Accounting, a signature program at Saint Joseph's University, in Philadelphia, Pennsylvania. The implementation and roll-out process has covered a variety of areas from navigation to key business processes and accounting within SAP R/3. With the evolution of the Sarbanes-Oxley Act and the need for compliance within a company, the department decided that students should be given exposure on how to use SAP R/3 to conduct 404 walkthroughs in consonance with the Sarbanes-Oxley initiatives. Due to the integrative nature of SAP technology the system is best able to conduct audit processes and create exception reports needed to identify material weaknesses and deficiencies.

INTRODUCTION

he Sarbanes-Oxley Act (SOA) was enacted by the United States Congress on July 30, 2002 and applies to all companies registered with the Securities and Exchange Commission (SEC). Such a company is one that is traded in a stock market in the United States (e.g. NYSE, Nasdaq, etc.). SOA establishes heightened requirements in the areas of corporate governance, financial disclosures, and accountability for fraud. Specifically, it requires organizations to periodically evaluate and certify/report the need for establishing guidance or requirements.

The SEC defines Internal Control (applying a framework known as COSO) as a process that is carried out by an entity's board of directors, management and other personnel, and designed to provide reasonable assurance regarding the achievement of control objectives in the following categories:

- Effectiveness and efficiency of operations.
- Reliability of financial reporting.
- Compliance with applicable laws and regulations.

Approximately 75% of accounting students at Saint Joseph's University begin their careers with work in Public Accounting, it seems only fitting that review of Sarbanes-Oxley takes place in the classroom. In conjunction with the ongoing implementation of SAP R/3 technology in the Accounting curriculum, the ability to teach Sarbanes-Oxley using SAP R/3, the most robust ERP package on the market, seemed most appropriate.

BACKGROUND AND PRIOR RESEARCH

Albrecht and Sack (2000) paint a dismal portrait of the academic accounting profession as a discipline stuck in the past and exhibiting an unwillingness to change. They observe that technological innovation has rendered the gathering and reporting of information as an inexpensive process in today's environment. Accountants must be armed, they propose, with new skills if they are to find a role in today's environment. They suggest that accounting educators should embrace the unfolding Internet revolution and include this experience as an integral part of the pedagogy of accounting education.

Extant literature suggests more and more integration of ERP type technology. David, Maccracken, and Reckers (2003), after just receiving an award for innovation in accounting education claims that the award demonstrates that the accounting academic community has recognized the importance of including technology and business process analysis in accounting education. Lambrecht (1999) encourages teachers to examine their assumptions about learning and weigh the benefits of the systematic approach and the minimalistic approach to teaching software. Strand, Welch, Holmes and Judd (2002) have developed a case in which they believe actual simulation is necessary in order to allow for the timely recognition of "red flags" in an organization, as they believe textbooks and other sources may only list various risk factors. These risk factors are not as apparent when they occur in the actual organization. Guthrie and Guthrie (2000) conclude in their research that it is to a student's advantage to become fluent in an ERP system in an environment integrated in the classroom, as it can give the students the closest simulation to "real-life" experiences using an ERP system.

Many references have been made to the specific ways to incorporate ERP technology in the classroom. Dickson and Segars (1999) produced an article in which they take a communications-based perspective to suggest that faculty need to understand the nature of new technology-enabled teaching environments, appreciate the opportunities the environment affords, and redevelop new teaching assumptions and paradigms. Fedorowicz, Gelinas, Hachey and Usoff (2004) point out that ERP system integration in the classroom is heavily time and resource consuming, with great frustration for both faculty and students alike. They also note that industry has responded very favorably to SAP integrated curriculums, both by offering support, and by firms hiring students. Antonucci and Muehlen (2000), claim that in order to prepare students for the new process of the ERP driven, web-centric, business to business orientation in the e-business world, universities need to develop curricula that expose students to the use of ERP systems by introducing organizational and technical issues that enterprises face when developing business to business processes. Joseph and George (2002) admit that the overall plan for incorporation of ERP into the curriculum must be sound. By creating artificial boundaries for functional areas in business education, ERP has the potential of enabling business education to overcome some of the battles it faces. They further mention this is necessary because the world is becoming more interconnected and interdependent, and business is becoming more complex and dynamic.

Haelst and Jansen (1997) and Srinidhi (1994), all argue for more technology based auditing standards. Technology would be able to assist the function of auditing, and by teaching auditing in conjunction with an ERP package, which could be of significant aid. Little and Best (2003) propose a complete SAP framework be developed, which they claim will be of great value for management, internal auditors, external auditors, and SAP implementation partners. The development of decision support applications will significantly reduce the task of checking for authorization and segregation of duties. A clear limitation of the current research is a lack of real hands-on application studies using SAP to teach auditing. What studies do exist are not generalizable to auditing or the applications of Sarbanes-Oxley in the classroom, clearly the profession needs to develop applications around the theoretical framework developed by SAS 78 and COSO. Brown and Vessey (2003) suggest that the next wave of enterprise systems development might lead to customizable software for audit applications for business and in the classroom.

Bisoix (2005) notes that Sarbanes-Oxley has not only herald a new era of transparency and accountability for corporate reporting, but also is a clarion call for changes in education. She cites Suffolk University Sawyer School as using a "gaming approach" in the classroom to discover material weaknesses in a company's process and test the strength of control procedures by looking for methods someone might employ to get around internal controls. In her

article, she notes that in response to a survey, every school that responded had incorporated some SOX material in their courses, most of them integrating the topic into existing courses.

SAP R/3 IN THE CLASSROOM

SAP R/3 and its full implementation in the classroom is nothing short of insurmountable. With the economy and stock market on the rise, firms are beginning to have excess money; thus, thousands of companies have been increasing their investments in technology. In the new millennium, "integration" and overall efficiency are two of the business world's newest concepts. ERP software has been able to develop hand-in-hand with these new phenomena. *Fortune* magazine recently rated enterprise computing as one of the top technologies to watch and predicted a 35 percent growth per year over the next three years.

Controlling over 50 percent of the market share, SAP is broadly recognized to be the market leader and four times larger than their closest competitor. Saint Joseph's University's mission is to offer degree programs that stress the development of the knowledge, skills, abilities, and values that prepare graduates to assume leadership roles in organizations of all sizes and types. In accordance with the University mission statement, it would seem rational for the Accounting Department to implement the premier ERP package into the curriculum. The objective in this is to offer students exposure to the most "cutting-edge" technology and its capabilities.

The SAP University Alliance Program for the United States, Canada, Central and South America builds upon the best components of such a program originally developed for European institutions of higher education. It has been developed by SAP America to facilitate the use of their software package (and integrated business solutions concepts) in the formal education of undergraduate and graduate students throughout the Americas. The program has grown from a charter of five members in 1997 to over 124 member institutions as of March 2003. The Haub School of Business is proud to be among the early schools granted admission in 1998.

Upon admissions to the SAP America University Alliance Program, new members receive four significant and valuable items. First, a fully functional copy of the SAP R/3 software, or the right to time-share with a major service provider is acquired. Second, they receive copies of all professional training materials used by SAP. Third, one hundred days of free training for faculty members at SAP professional training classes. The amount of training is dependent upon the level of involvement that a member institution desires. Fourth, they are given access to technical support from SAP. In addition, SAP is actively working with its member institutions to ensure cooperation and sharing of course materials among member institutions.

There are several things that separate SAP R/3 from its competitors. The ability to be a fully-integrated package, with real-time applications, is the most unique of them all. No other software package has the ability to be as fully integrated as SAP. When information is entered in one module, or one department, the same information is reflected throughout the system. SAP has the most sophisticated control and audit functions. The in-depth security tools, administration profile, fully traceable transaction history logs, unique logging-in and access restrictions, as well as their Business Workflow environment, all allow for SAP to easily assist with Sarbanes-Oxley auditing. Finally, both SAP's program and data files are fully integrated into one virtual file structure. This integrating allows for users to know that all information is stored in one place, without the need for other database systems to be maintained. By having SAP fully embedded in the Accounting curriculum, a competitive advantage for when students enter the working world is achieved—particularly with larger firms.

SARBANES-OXLEY

Just like ERP and SAP, Sarbanes-Oxley is the new phenomenon that has taken over the public accounting profession, and as previously mentioned, along with the fundamentals, the most current and important topics and issues belong in the Accounting curriculum. With the downfall of companies like Enron and Worldcom, and many other accounting scandals, the Sarbanes-Oxley Act was quickly implemented on July 30, 2002 in order to curb these negative actions, and hopefully to restore investor trust. This legislation called for strict corporate accountability and implemented some guidelines to which public auditors have to conform. The Sarbanes-Oxley Act seemed to have hit

Corporate America by surprise, in that public companies scrambled to comply, and some even de-listed from the publicly traded markets in order to save time and money. A comprehensive review and verification of both financial and managerial information was now necessary at a high level, in order that management would sign off to attest that the information is reasonably and fairly presented. These statements provide a problem for many ERP systems because at times information is not stored in the same place, and more than one package is used to perform different functions. The call for an integrated database in order to verify results was a hindrance that many companies had to overcome this past year so that they could be deemed "compliant." For those companies who had implemented and become familiar with SAP R/3's functionalities and capabilities, this task may have provided to be less daunting than to those who had not. SAP's ability to be a fully-integrated system has simply cut out the necessity to homogenize data.

Accounting Standards are rapidly changing and become more stringent. Familiarity with Sarbanes-Oxley is necessary because these new standards have become unavoidable to most. No other piece of legislation has had as much impact on public corporations for seventy years as the Sarbanes-Oxley Act; implementing Sarbanes-Oxley in the accounting curriculum is essential.

IMPLEMENTATION PARADIGM

In response to the call of Albrecht and Sack, whose article on changing the course through a perilous future directed immediate change in course curriculum, Saint Joseph's University made major pedagogical revisions to the undergraduate curriculum in Accounting. First, a newly created three course sequence encompassing intermediate and advanced accounting was developed. Second, another group of courses to incorporate application issues in accounting was developed. The first course, called Management Accounting Information Systems I (MAIS I), deals with cost analysis. The second course, MAIS II, deals with audit, information technology, and internal control issues. SAP exposure has afforded students in all courses. The greatest emphasis, however, is in MAIS II. The goals of the MAIS II course are to:

- Understand the broad issues pertaining to business ethics.
- Have a basic understanding of ethical issues related to the use of information technology.
- Understand the internal control structure defined by *Statement on Auditing Standards No.* 78.
- Recognize the implications of computer technology on the internal control structure.

CLASSROOM IMPLEMENTATION

SAS 78 defines major elements of internal control. We have developed a mnemonic, SPARCLE as a teaching tool in order to more easily take the students through the process of defining the areas of internal control. As taught in conjunction with our SAP R/3 classroom implementation, the students learn how to identify methods that would allow for better business practices, while complying with federal laws and regulations.

Segregation of Duties involves separating the custodial function from authorization, and the authorization function from reporting. Assigning the responsibilities for authorizing and executing a transaction should not be same person or function. Additionally, combining responsibilities for authorizing and recording a transaction should be separated. An example of this would be one who enters a sales order over a customer's credit limit in SAP, cannot authorize an above credit limit transaction themselves. A person with superior access would need to override, or release the transaction for processing. The ability to have segregation of duties forces what is called personnel supervision. When responsibilities are separated, there is not only the ability to make sure no one has too much authorization, but for the ability for those who are in supervisor roles to oversee transactions. When supervised, one is more inclined to act ethically and properly than if one were to be left alone. Personnel supervision, which is viewed always as a mitigating control, is particularly important when real assets are being managed.

Authorization has many implications. With regard to the segregation of duties and personnel supervision, no one should have supreme authorization, or the other controls would be negated. Authorization provides an independent check on data entry and access to files. Records must link the system and support the process being

delivered. These records constitute critical and verifiable information to auditors that transactions have occurred. With the development of Sarbanes-Oxley, the ability to show an organized audit trail, or document flow is extremely essential. In SAP, depending on the business process, there are various tools used to account for records. Check up on performance means there is a continuous process by which steps are verified and validated assuring a continuous oversight of transactional information. By testing transactions on a routine basis, greater comfort is able to be achieved that proper reporting will take place. Limited access to the database through user log-ins and passwords insures that only people authorized are able to access important information.

The final step is an evaluation process that would constantly oversee the entire process, and further allow for enhancements or modifications to allow for a greater reliability on internal controls. This SPARCLE process can, and should be adapted to every business process in order to make sure the proper controls and procedures are in place. Without these functions, there is greater ability for fraud and other financial and non-financial misrepresentations.

WALKTHROUGH

Appendix A contains an SAP based script which describes how we teach SAP and internal controls together. We will now identify each of the features identified under implementation and how they are taught using a Sales and Receivables Script using SAP R/3.

We always begin with a simulated scenario. In this case, a new customer has to be created. We show the students the customized implementation guide available within SAP R/3 prior to the creation of the customer. Within the implementation guide, we show them that the credit control area and credit risk categories have been turned on. The SAP system can be configured with an automatic credit control to perform credit checks automatically as customer sales order information occurs. If a customer exceeds a certain credit limit, a warning message will occur and a block is set in the credit status of the document, so that further processing cannot continue until the credit problem is cleared by an authorizing manager.

With the structure for sales and credit receivables carried out, the next step is to show students the controls integrated within the master file. From the master file, one can see the segregation of duties, as the three views of the master file break down by general data, company code or accounting data, and sales area and marketing data. The marketing personnel cannot tamper with the accounting data, and visa versa. In compliance with supervision, a section in general data defines correspondence and dunning procedures associated with the customer. This section allows marketing management an overview of the customer's relationship with the firm. Authorization is achieved by identifying payment data (i.e. allowing authorized discounts, and payment methods.) Assigning incoterms will define the legal point where transfer of goods from buyer to seller occurs. Critical to our scripts, the authorization from credit must be assigned once the customer is created, which is assigned through a special area known as credit control management.

In order to grasp an understanding on how the process really works (the remaining components of the walkthrough) we have the students set a customer credit limit and then walk through a sales order process in order to check the credit authorization. First, they transact a sales order below the credit limit established for this customer. At each level of the process, records are created and documented, under the icon known as "Document Flow" on the main page of the sales transaction. Within this document flow, one can test not only records, but authorization as subsequent steps cannot be done, before the preceding step has been done and carried out. The person authorized to carry out each function is also identified, as well as when the transaction occurred, what transaction actually occurred, and for how much. At the end of the walkthrough, students can then trace the financial information to the accounting ledger, as a decrease to inventory, an increase to cost of goods sold and receivables, and a recording of a sale on the income statement.

During a second iteration, students exceed a credit limit of \$1,000. When they attempt to save the sales order, a dynamic credit check reports that the sale exceeded approved credit limits and by how much. The sales order can then subsequently be saved, but it is blocked from further processing until the credit limit problem has been worked out. Usually an important task in credit management is to review all blocked orders and determine how they

should be handled. In the review, students decide to record the sale or hold the block, and await further communication with the customer. If they decide to release the blocked sales order, a record is generated by the system showing the exception and logging the date, time, and how it was authorized. This exception report, uniquely available in ERP type systems, has several teaching advantages. First, it shows the integration of accounting and sales. Second, it provides an audit control document, validating that the system works the way it is designed to work. Finally, it provides a management report, usable by both customer management and account management, for possible follow up and dunning.

IMPLEMENTATION CHALLENGES

Over the past decade, improvements in technology have created a situation in which auditing using the computer is both more effective and efficient than in the past. In order for this process to be successful, several critical components must be in place.

First, a faculty team, working together with a willingness to experiment with technology in the classroom, is necessary. Faculty need to agree with the curriculum components in the classroom that are to be integrated with technology. There is no room for the pedagogical battle between academics and training, as integration alone links the two. Faculty who participate must be adaptive. The team should reflect both tenured and non-tenured people. As business schools respond to demands for a more integrated curriculum, faculty must respond with willingness to work as a team, and jointly create and produce a curriculum. Top down support from the administration is very critical.

The infrastructure must be fully funded that allows for uninterrupted integration of computers in the classroom. Saint Joseph's University has a required laptop program with a strongly committed infrastructure to fully support integration in the classroom. Hardware is not sufficient; there has to be a reliable database and program supplier. In our case this problem was resolved through the University Alliance and with the University of Wisconsin – Milwaukee—our host site.

A third factor is the management of the course itself. This requires that faculty show a willingness to work well with students outside the classroom. A unique feature of the course pedagogy is the utilization of STAR Scholars to assist in the development and delivery of various SAP scenarios. These scholars are chosen through a highly selective process and specially trained to deal with these application scenarios. To date, there are some forty STAR Scholars comprised mostly of junior and senior undergraduate majors. These students are compensated for the work done outside of the class and are provided with enrichment activities, such as field visits and guest speakers, helping them to understand the essentiality of implementation of state of the art software.

The final great lesson is to implement a plan to manage the program's success. As word got out that Saint Joseph's University was increasing the technology coverage in the accounting curriculum using SAP, our program got the attention of headhunters, public accounting recruiters, and industry recruiters, which also played a role in the awarding signature program status to the Department of Accounting. Placement of students doubled in the super four public accounting firms over the past four years, and our major has grown by 68 percent over the same four year period.

Today, our university has more Accounting internships than ever before, and the financial support provided by firms and alumni has increased over 50 percent. The lesson learned here is that if you make a commitment to adapt your curriculum to integrate with a heavy hands-on technology component, and to stay abreast of how technology changes accounting. The programmatic rewards are endless.

SUMMARY

The amount of interest in courses dealing with SAP R/3 has been overwhelming. SJU has been successful because we have carefully managed both the infrastructure and the interaction with the external environment in positive ways. Our curriculum focus on technology integration with Accounting and Auditing has been a challenge to both faculty and students. Fortunately, we have built strong partnerships with Deloitte and Touche, DuPont, Ernst and

Young, IBM, KPMG, PricewaterhouseCoopers, SAP, and Wyeth. These partnerships provide an ongoing reservoir of capital and technical support.

The scenario covered in this paper demonstrates only one of the scenarios we used to teach Accounting and Auditing using SAP R/3 software. Our students leave the program with higher salaries than graduates of most schools in the Philadelphia area, and a greater appreciation of the integrated framework in the business, the roll that technology plays in that framework, and how important internal controls are in auditing the system. Our objective of increasing students' understanding and appreciation of how a modern day business has been audited in a technological environment has clearly been met.

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APPENDIX A

You have decided to implement the Credit Management function in SAP to better manage Accounts Receivable to minimize the risk from customer default while making sure that the impact on sales due to credit blocks is reasonable and minimized.

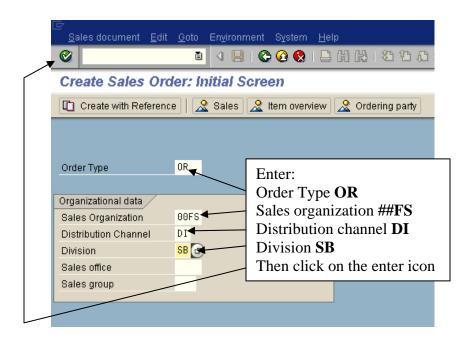
Some configuration settings have already been made to allow for credit management, using the IMG. Assume necessary changes have been made, to allow for a \$1,000 credit limit for ## Health Express. We will now check to see that the settings made function properly.

Note: ## is a unique two-digit number that is assigned to the individual user.

1. **Create Sales Order**

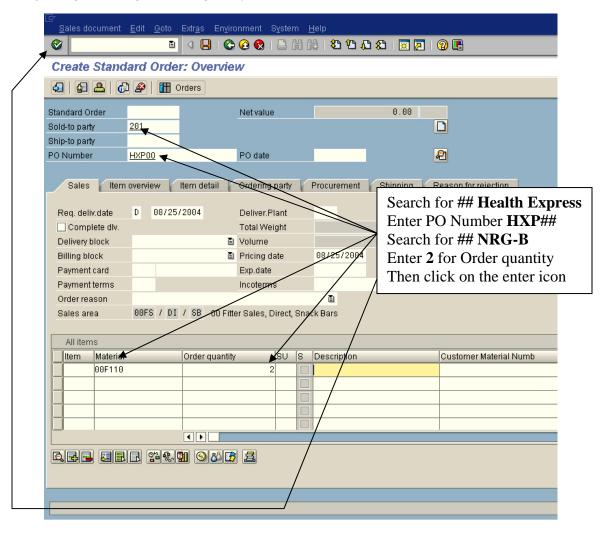
To test the credit check, first we will create a sales order that will be within the \$1,000 credit limit for ## **Health Express**. To create the sales order, follow the menu path:

▶Logistics ▶Sales and Distribution ▶Sales ▶Order ▶Create which will produce the following screen:

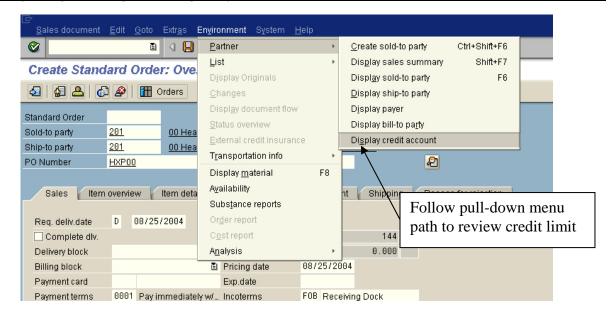


Make the following entries, then click on the enter icon () and the following screen will appear:

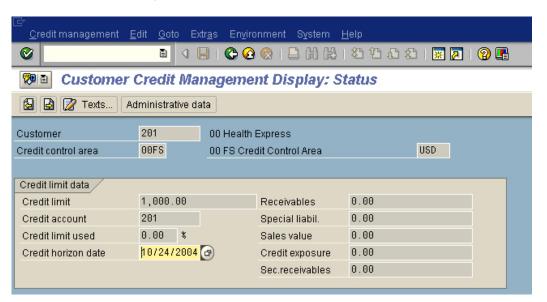




Enter the information shown above, then click on the enter icon. Next, follow the pull-down menu path **Environment**→**Partner**→**Display credit account**:



From the Create Sales Order screen, we can check the customer's credit status:



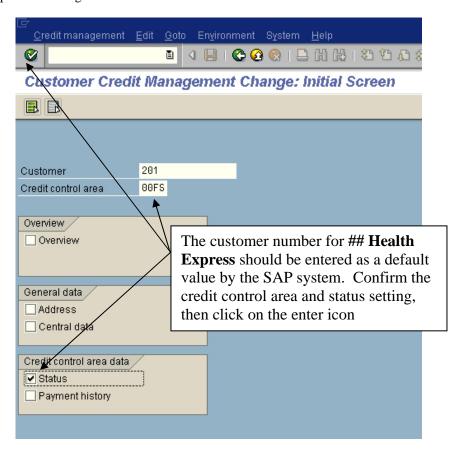
Because we have not saved the sales order yet, ## Health Express has all of its \$1,000 credit limit available. Click on the back icon () to return to the Create Sales Order screen, then click on the save icon () to save the sales order. When the sales order has been saved, click on the back icon () until you are back at the SAP Easy Access screen.

2. Review Customer Credit Limit

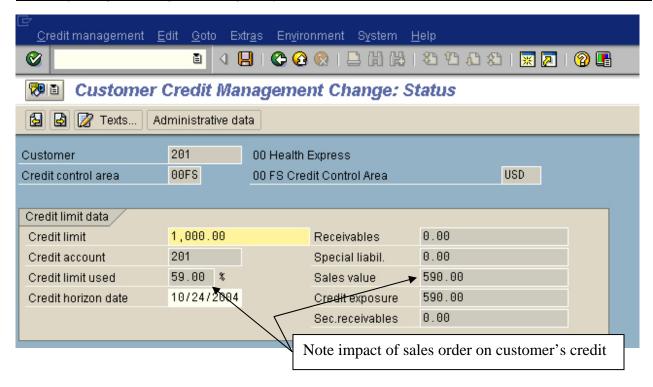
Now that the sales order has been saved, it should be reflected in the customer's available credit. To check this, follow the menu path:

▷Logistics **▷**Sales and Distribution **▷**Credit Management **▷**Master Data **▷**Change

which will bring up the following screen:



Confirm the information required for **## Health Express**, then click on the enter icon (). The revised credit limit data will be displayed:



Note that the sales order has used 59% of ## Health Express's credit limit.

3. Create Sales Order Over the Credit Limit

If ## Health Express orders another 2 cases of NRG-B bars, this should trigger the Automatic Credit Check logic as it would cause ## Health Express to exceed it's credit limit. To check this, create another sales order as in Step 5. To do this, follow the menu path:

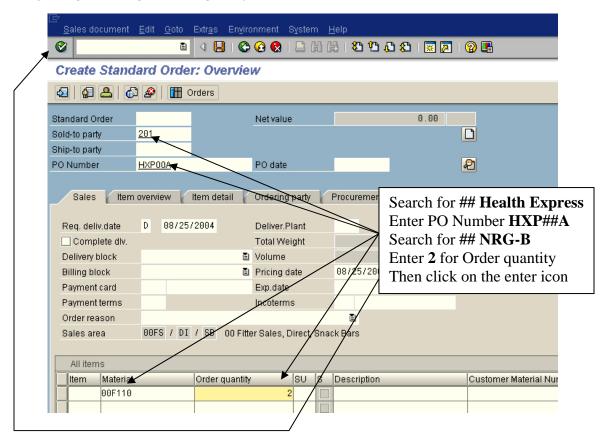
▷Logistics ▷Sales and **Distribution ▷Sales ▷Order ▷Create**

Enter the following information:

Order Type **OR**Sales organization ##**FS**Distribution channel **DI**Division **SB**

Then click on the enter icon (





Enter the information shown above and click on the save icon (|), and the following message will pop-up:



This is a result of the settings that were assumed to be made previously. We set up for an Automatic Credit Control in which we would get a <u>warning</u> message plus information as to the amount by which the order exceeded the credit limit. Because we specified a warning message, we can save the sales order, but it will be blocked from further processing until the credit limit problem is resolved. If we had specified an <u>error</u> message for the reaction, the order

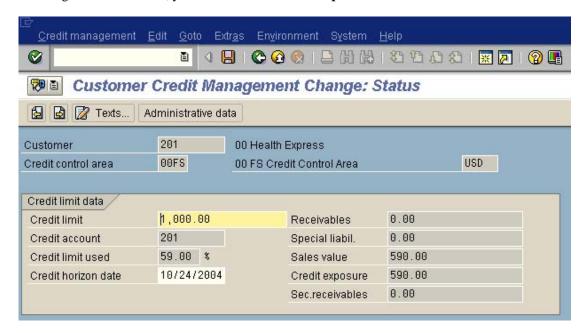
would not be able to be saved. Click on the enter icon () on the message to save the order, then click on the

4. Review Customer Credit Limit Again

Now that the second sales order has been saved, we should check how it appears in the customer's available credit. The menu path for credit management is:

▷Logistics **▷**Sales and Distribution **▷**Credit Management **▷**Master Data **▷**Change

After confirming the customer data, you can review ## Health Express's credit:



Note that the amount of credit used has not changed! While we saved a second order for ## Health Express, it is blocked, and as blocked orders cannot be processed further, the SAP R/3 system does not count them against the customer's credit limit.

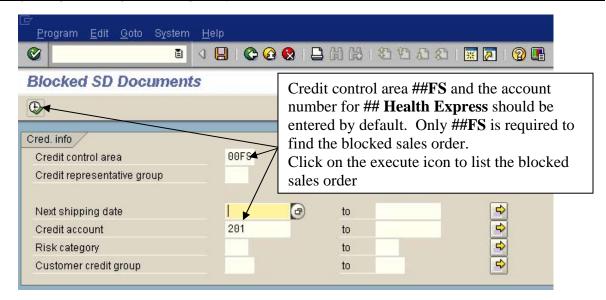
5. Review and Release the Blocked Sales Order

Usually an important task in credit management is to review all blocked orders and decide how they should be handled. In a reasonably large company, this might be a task performed every few hours.

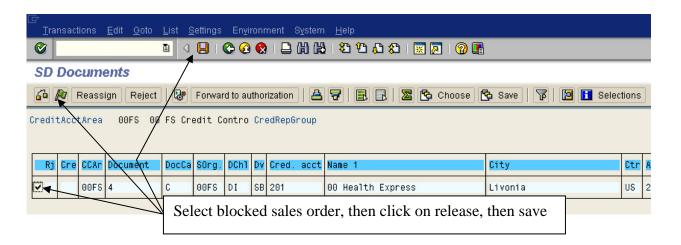
To review the blocked sales order, follow the menu path:

▷Logistics **▷**Sales and Distribution **▷**Credit Management **▷**Exceptions **▷**Blocked SD documents

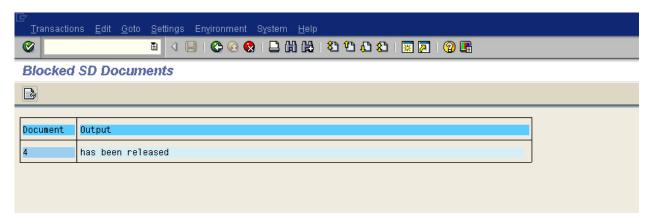
which will produce the following screen:



Make sure that at least **##FS** is entered for the Credit control area, then click on the execute icon (). This will produce the following report:



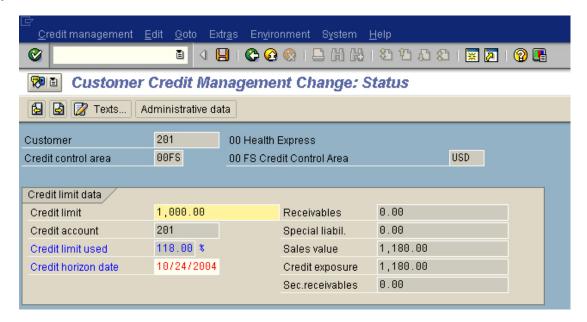
We will release this sales order for further processing. To do this, select the order by clicking the check box, then click on the release icon (), then click on the save icon. This will produce the following message:



Use the back icon () until you are back at the SAP Easy Access screen, then recheck the credit limit using the menu path:

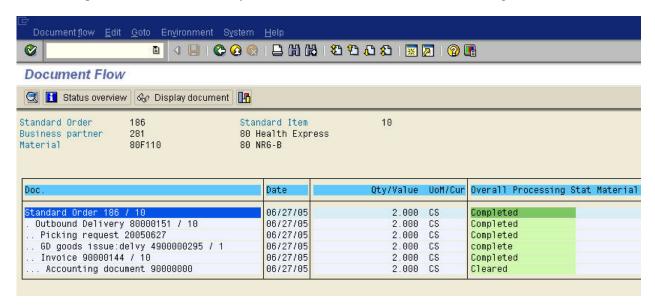
▷Logistics **▷**Sales and Distribution **▷**Credit Management **▷**Master Data **▷**Change

The just-released sales order is now reflected in the Customer's credit limit status:



6. Review Document Flow (after Order Entry to Cash Completion)

Completion of the full Order Entry to Cash Collected would allow for the following document flow:



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